Summer 1987

NAVY CIVIL Engineer

Navy work program allows

Married Couples

to work side by side

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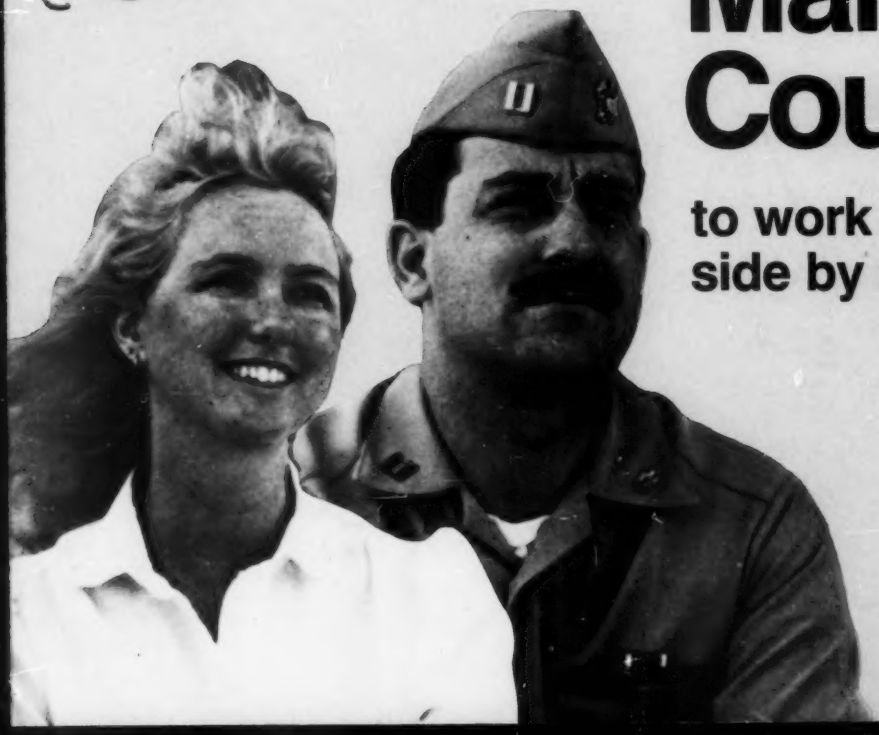

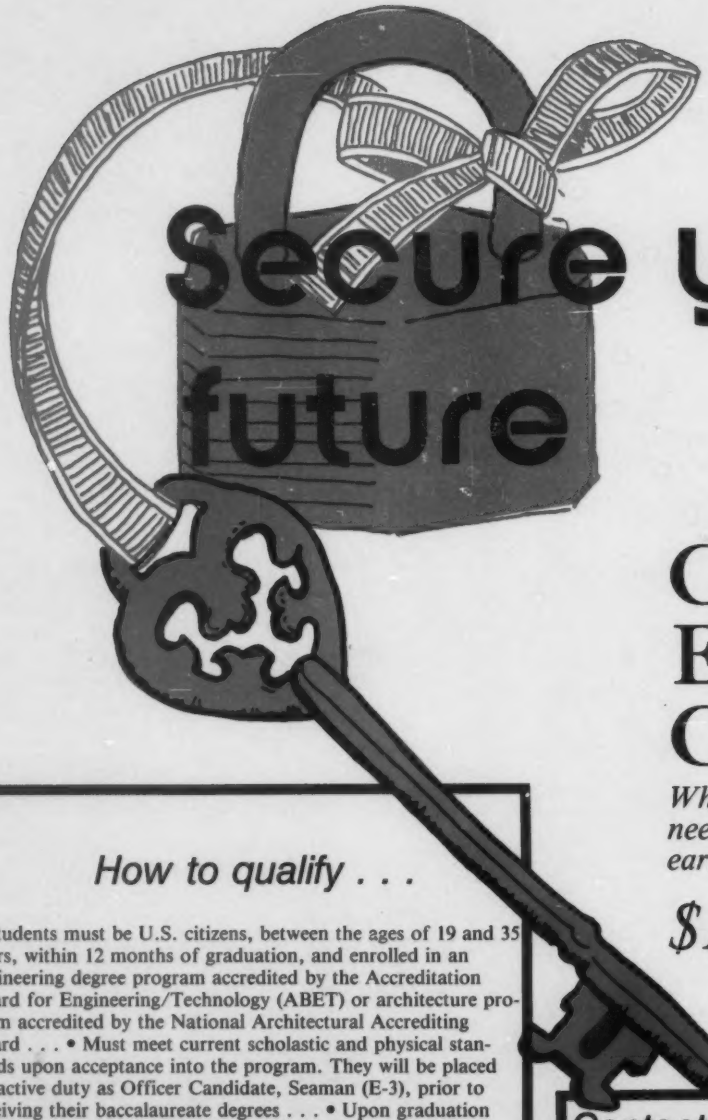

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Meaningful employment for Navy spouses is fast becoming a reality through a new program designed to ease the strain for Navy couples at new duty stations. Two of these couples share the cover of this issue — The Wiegands, Lt. Francis and Leslie; and the Knapowskis, Lt. (j.g.) Stephen and Lori. Both are taking advantage of the Professional Development Center Program. The larger photo at the upper right are the Knapowskis and the Wiegands are at the lower left.

Summer 1987

NAVY CIVIL Engineer

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Issue	Theme*	Material Due	Distribution Date
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FALL 1988	Public Works	July 15, 1988	Oct. 1-15, 1988

*It is hoped to have several articles in each issue on the major theme, but no issue will be made up only of theme articles. All qualified material is welcome and will be considered for publication.

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SW1(DV) Clifford A. Taylor, USN

Naval Construction Training Center, Port Hueneme, Calif.

Specialty: Underwater Construction

SW1(DV) Clifford A. Taylor joined the Naval Construction Training Center (NCTC) in July 1984, becoming an Underwater Construction Technician (UCT) Instructor at Delta Company. He is a qualified diving supervisor at the school and has made significant revisions in the student and instructor curriculum for the UCT field. In addition, he attended the advanced UCT course and is now the phase head for the advanced UCT training at this command.

Petty Officer Taylor holds a bachelor of science degree in occupational education from the Southern Illinois University at Carbondale.

He has served as the crew leader of construction, and crew leader of the CNO ship-to-shore refueling project at the Amphibious Construction Battalion One in Coronado, Calif., and was the assistant petty officer in charge of deployments for Underwater Construction Team One at Little Creek, Va.

Born in Cleveland, Ohio, Petty Officer Taylor grew up in Kennewick, Washington, before enlisting in the Navy in 1979.

When he isn't revising curriculum on the computers at the command or trying to learn the new software, he spends time watching to see if his hair will grow (it's like watching the grass grow!), or rock climbing and sky diving (perhaps that's how he lost his hair to begin with). Petty Officer Taylor will be transferring to Underwater Construction Team Two, Port Hueneme, Calif., in September 1987.

He is a CPR instructor for the Red Cross, pack leader for the Boy Scouts, and a member of American Vocational Education Association and the Southern California Wrestling Officials Association.

SW1 (DV) Taylor at work.

Naval Construction Training Center, Port Hueneme (NAVCONSTRACEN) provides courses of instruction in basic and advanced training for the seven Seabee (occupational field 13) rates, along with disaster preparedness training and the Underwater Construction School (joint Army/Navy school) for active and reserve Navy personnel, Army and Air Force members, foreign military students, and civilians. There are seven basic ("A") courses, 27 advanced (C-1) courses, 180 special construction battalion training (SCBT) courses, the disaster preparedness specialized instruction, and basic and advanced Underwater Construction Technician courses.

NAVCONSTRACEN is designed to administer the courses and programs assigned by the Chief of Naval Technical Training, ensuring that personnel are trained for early usefulness in their designated specialties and provide formal and refresher training in order to supplement on-the-job training.

By JO2 CYNTHIA VANDERKOOI LEE

Cementitious crystallization coating 'works' for waterproofing concrete swimming pools

By B. I. AZAR
P.E., Wis.
Atlantic Division, Naval Facilities Engineering Command
Norfolk, Va.

In December 1979, the Administrative Support Activity in Bahrain asked the Atlantic Division, Naval Facilities Engineering Command (LANTDIV) to recommend a new type of paint for their swimming pools, one that would overcome the hostile environment in Bahrain and last for several years. Paints and coatings, such as TT-P-95 chlorinated rubber and other vinyl top coatings applied to the swimming pools, had all failed within less than one year.

The assistance was sought to repair and waterproof the activity's largest swimming pool, 50 meters long. The concrete walls were tiled and the concrete bottom had deteriorated badly and had many cracks which allowed a high rate of infiltration from the brackish water table into the pool.

The inflow of ground water made controlling the bacteriological quality of the pool water more difficult. Thus, the goals were to stop the inflow of ground water and to extend the pool coating life for several years.

Since most paints and coatings have poor vapor transmission capability, the formation of vapor beneath a coating generally results in escaping vapor breaking through the paint and coating bond. Bahrain's hot sun (120 to 130°) and high humidity (70 to 100 percent) produce a high vapor build-up in the concrete which was suspected of being the major cause of paint failure. To overcome this problem, a criteria for selecting the proper coating was established. The criteria consisted of the following:

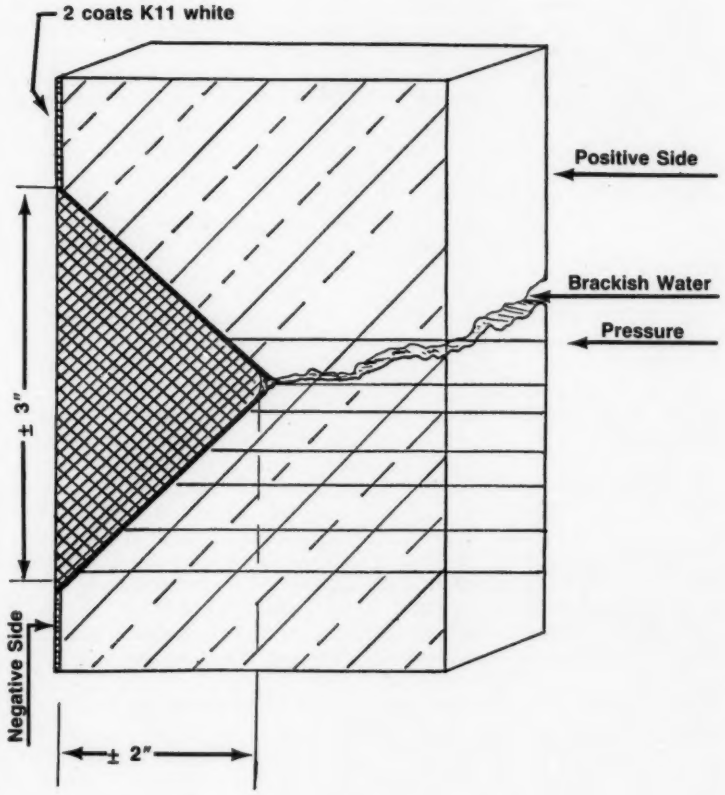
a. Non-flaking, long-term resistance to exterior weathering

b. Non-chalking, cracking, or peeling

c. Good vapor transmission capability

d. No leaching of toxic chemicals by swimming pool water. Certificate of approval for contact with potable water from EPA is required.

e. No discoloration, erosion, or blistering



Repair on inside of pool of leaking cracks

- **Cut back concrete approx. 2" deep, 3" wide.**
- **Mix "rapid powder" with water to paste consistency and force into cut by hand. Hold in position with hand pressure for approx. 30 seconds to stop active water.**
- **Apply two coats of K11 over entire surface of pool.**

Penetration of concrete is main advantage

f. Resistance to mildew growth

g. Five-year minimum warranty by the coating supplier

After extensive study of coatings and paint properties supplied by many manufacturers, a decision was made to use a cementitious crystallization coating (Hey'di K-11 with Hey'di SB Bonding Agent, manufactured by Hey'di American Corporation, Virginia Beach, Va., was selected because of its superior qualities in meeting ASTM standards and the established criteria).

The advantage of the coating is that it penetrates into the capillary tracts of the concrete surface through moisture absorption (humidity) and reacts with the free lime to form crystals, creating a waterproof surface. These crystals penetrate the substrate and become part of the concrete.

In March 1980, a contract was let to repair the 50-meter pool and apply coating with the bonding agent. Because of the prohibitive cost of travel and fee for the material supplier to supervise the coating in Bahrain, LANTDIV engineers, collaborating with the coating manufacturer, developed detailed instructions to guarantee the success of the coating application. Two coats at the rate of three pounds per square yard per coat with the bonding agent were recommended.

CONCRETE SURFACE PREPARATION

It is widely recognized that surface preparation is the most important aspect of painting or coating concrete pools. Since the Bahrain pool was in an advanced stage of deterioration, additional work was necessary. The first step was to remove all tiles and rough, loose mortar.

This was followed by sandblasting to remove all flaking, blistering, cracking, and chalking of the old paint. Then all cracks and small holes were repaired with non-shrinking cement. Leaking cracks greater than one-half-inch wide presented a special challenge. These cracks were repaired by cutting back concrete approximately two inches deep and three inches wide.

Then a powder, called "Rapid," used to stop actively flowing water under pressure, was mixed with water to a paste consistency and was forced into the cut by hand. With hand pressure held in position for about 30 seconds, the active water leak was stopped and sealed (See illustration).

APPLICATION OF COATING

Prior to the application of the coating, the pool concrete surface was saturated with clean potable water. When the surface was damp to the touch, the first coat of the coating slurry was applied by brush to the vertical walls to completely fill holes and pores. Each coating slurry batch was prepared by mixing one 50-pound bag of cementitious powder with two gallons of clean water and bonding agent ratio (5:1) in a concrete mixer and processed for five minutes.

To maintain the correct coverage rate, each batch was applied on 16 square yards by going over the same area repeatedly until all material was used up. This operation was repeated many times until all of the walls and the bottom of the pool were coated.

After drying for 24 hours, the second coat was applied using the same mixing and application procedures for the first coat. Immediately after the second coat was applied, it was steel-hand troweled to obtain a smoother finish. Seven days later, the pool was filled with water.

ECONOMIC VALUE

The Bahrain pool coating provided a dried, cured, finished coating of between 60 and 70 mils. Cost of the material was 17 percent of the total contract cost with a guaranteed life expectancy of five years. Comparing this cost with the cost of TT-P-95 chlorinated rubber paint for tropical applications indicates the paint cost is approximately 10 percent of the total contract cost.

The remainder of the cost, or 90 percent, is for surface preparation and application. Furthermore, available performance data for rubber paint indicates a life expectancy of from one to three years. Based on these findings, it is apparent that the crystalizing coating material is superior to the rubber paint, more cost effective, and results in substantial savings of maintenance and programmed painting.

Crystallized coating superior to rubber paint — cheaper too!

CONCLUSION

After five years of continuous use and exposure to hot sun, high humidity, high hardness water, and high alkalinity, no coating failure has been reported. Based on the performance of this coating, it is a viable alternative to TT-P-95. Furthermore, the material manufacturer provided a 10-year warranty. And, finally, before any coating or paint is specified for a swimming pool, a competent engineer familiar with coating/paint properties should always review all pertinent specifications and determine suitability. □

By LT K. G. TUEBNER, CEC, USN
Facilities Acquisition Instructor
CECOS, Port Hueneme, Calif.

Government should decide price by risk amount

The contractor, not the government, is the one who must ultimately decide how much "risk" to include in change order proposals, negotiated before the work is allowed to proceed. After all, isn't the contractor in a better position to know the real cost of doing business? It is often said that this is why the contractor can legitimately ask for as much as he wants—it is the government's responsibility to decipher the proposal and settle on a fair and reasonable price dependent on the amount of risk.

It is legitimate, though, when a knowledgeable contractor purposely submits a grossly inflated proposal? The answer is no! A contractor has the right to request reasonable consideration (time and money) for changed work. By law, it is illegal to knowingly and willfully make any false, fictitious, or fraudulent statements or representations (18 USC 1001), or submit any claim, knowing that the claim is false, fictitious, or fraudulent (18 USC 287). This applies to all proposals, regardless of amount. Unfortunately, it is difficult to enforce—it is hard to prove "knowingly and willfully" because overinflated proposals may easily be confused with overzealous risk analyses on the part of the contractor.

What about the contractor who *consistently* submits proposals that are at least 50 percent higher than the final negotiated amount? In this case, there is something that should be done. Document the *trend* and reflect it on an unsatisfactory performance evaluation (SF 1420). This might just get the contractor's attention. Remember, there are other regulations that assist you in review of a contractor's proposal.

The contractor must provide a cost breakdown, acceptable to the contracting officer (contract clause 52.236.7001) and his/her costs must be allowable by FAR Part 31 (contract clause DFARS 52.243.7001). For any proposal expected to exceed $100,000, FAR 15.804-4 requires the contractor to certify his/her price proposal and DFARS 15.805-5 essentially requires a DCAA audit of his/her proposal.

Consider the occasional situation where the contractor negotiates the cost of work after the work has been completed. Does the contractor have the right to base his/her proposal on engineering or experience estimates which are *grossly inflated* when compared to actual work records? This type of proposal is considered fraudulent by its very nature.

Most change order disagreements result from honest differences of opinion, but occasionally a situation exists when they do not. . .

A statement made under 18 USC 1001 does not have to intend to defraud (which is defined as "the intent to deprive of something by deception") but it must have been made with an intent to deceive. The contractor has a duty to ensure that his/her estimate reflects reasonably incurred costs. Checking available work data such as daily reports, payrolls, or supervisor's logs would be the obvious way of performing that duty.

Failure to do so demonstrates a reckless disregard of learning the truth which is sufficient to show intent to deceive; i.e., that a false statement was knowingly and willfully made (for reference, see U.S. vs. James T. White, Jr., 11th Cir., #83-3109, 22 July 1985).

GROWING: THE ART OF Anti-Terrorist Engineering

By LT MARK D. BUFFKIN
CEC, USN
Officer-in-Charge
Construction Battalion Unit 409
Long Beach, Calif.

Put yourself behind the desk of the naval station commanding officer. You have just been briefed by the Naval Investigative Service (NIS) department head that their sources have uncovered a definite possibility for a terrorist incident (attack) on your base within the next 72 hours. The terrorist support group in the local area is determined to take revenge on U.S. Naval Forces homeported at your facility for committing "acts against their homeland."

You call a staff meeting in an hour. You must use the information you have to answer these questions: What threat condition (threatcon) should be established? How will we deter against a terrorist attack? How will we react if the incident cannot be prevented? Is our security department large enough to deter and defend the entire base area against this terrorist threat? How long can we sustain such a high-security posture?

Consider this article a supplement to another article published in the *Navy Civil Engineer* (Fall 1986), "The Art of Anti-Terrorist Engineering" by LCdr. James Thomas of Naval Mobile Construction Battalion (NMCB) 74. Recently my unit participated in an anti-terrorist exercise conducted for nearly two weeks by the Naval Security Coordination Team (NSCT), whose mission is to test security on board naval facilities worldwide. We used the lessons learned of NMCB-74 and added our own to the list.

It is apparent that even though terrorism is as old as the French Revolution, the art of deterring and defending against it *effectively* is relatively new. During the first four years of this decade, international terrorism increased 30 percent — twice the rate of increase as in the 1970s.

The commander who plans

DUE TO A LACK OF PHOTOGRAPHIC CONTRAST BETWEEN TEXT AND BACKGROUND, THIS PAGE DID NOT REPRODUCE WELL.

ahead would do well to plan ahead for terrorism. Seabees can be a viable force against terrorists by augmenting reactionary security groups, or by responding as a reactionary force where no other such capability exists.

Seabees are assigned and deployed to most if not all major naval facilities worldwide, are trained in defensive tactics and small arms qualification, and are usually within reach of their Table of Allowance (TOA) of tactical gear and weapons. We are also trained and equipped for disaster recovery should the unfortunate occur. There is no need to be unrealistic about terrorism in the Continental United States (CONUS). It can happen — and defending against it in the U.S. will not be easy.

The types of possible terrorist situations are endless in quantity. The area or local commander must establish a threatcon Alfa, Bravo, Charlie, or Delta based upon the intelligence received. The Chief of Naval Operations (CNO) has published the definition of each of these threatcons with a list of measures that must be maintained as long as the threat exists.

This is a broad but good start to preparing you for your situation. Common sense will fill some of the gaps in these defensive measures; high-tech equipment will help you fill the rest.

COMMON SENSE

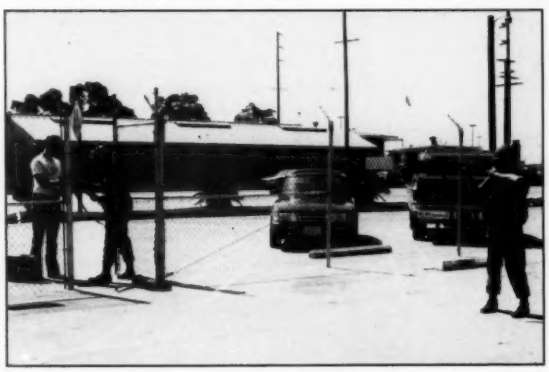
The backbone to the entire security evolution is, without a doubt, the sentry. If your system of watchstanders breaks down or is not set correctly, then you have already lost. Unfortunately we usually take our most junior people straight from boot camp and place them on the mid-watch at the most remote sector for an unchecked period of time.

Don't jeopardize the life of a sentry by placing him at a gate alone.

Don't jeopardize a life or the lives of others by making an easy target of a sentry. Time invested in preparing sentries for their duties is time well spent. Seabees are capable of doing the job right, but the leadership must keep them informed, trained, and concerned for their performance.

We found it the best policy to keep sentries visible in the daylight hours, moving and alert. At night the sentry should be away from direct light. Most of a sentry's time should be spent standing still, in the shadows, making the rounds at random intervals approximately every 5 to 10 minutes so that any patient observer cannot determine a normal routine or position.

Terrorists operate in small groups or alone, so they will define your routine to their advantage. Vary the times that you change your sentries. Vary the number of sentries from time to time. A terrorist who is about to make a move may change the plans and try another day if he or she detects something unexpected.



Gate sentry touch-checking an ID card with a back-up sentry in the ready.

IDENTIFICATION CARDS

Identification (ID) cards are the ticket through the main gate and to any potential target. It is probable that your Seabee auxiliary force will be required to augment security checks at base entrances, building entrances, and command office entrances.

There is a list of many different types of military ID cards: active duty, retired, dependent, civilian employee, security badges, shipyard passes, visitor's passes, only to name a few. And who's probably going to be checking ID cards? Your junior Seabee who has been in the Navy for six months. We found it important to have the base security department brief all sentries on their ID card policy.

Also, the sentry should be required to physically point and touch any passer's ID card upon inspection. This procedure forces the guard's eye to focus on the photo on the card. Some of the poor quality photos often seen on ID cards could pass for anyone. NSCT proved it was possible, particularly in the cases of civilians with longer hair.

Communication - lifeblood of coordination

Before a sentry is approached by anyone, day or night, the approacher must be in the rifle sights of a back-up sentry. This policy may not go well with some people, and it didn't with me either until the NCST members "shot" two of my sentries who were not properly backed by another guard.

You are endangering the life of a sentry by placing him at a gate alone. Distribute whistles to all sentries. Check your sentries at infrequent intervals. If I can sleep standing up, then I know other people can also.

OTHER DEFENSIVE MEASURES

Offsetting barricades to slow and impede traffic through the base entrances is an obvious measure that must be added. But do it correctly. Traffic must be made to slow down approaching and leaving a gatehouse from both directions. Prevent a car full of terrorists from driving up to a gate, ignoring the guard, and flooring it from there. Barricades in the lane behind the guard post will give the guard time to react to the incident. Many gates have trip barriers such as pop-up steel posts and steel cables.

Many other defensive measures are taught by the regiments at Port Hueneme and Gulfport that can and should be used to protect the host command. Proper positioning of flood-light trailers will brighten dark areas and shadows. Trip-flare devices are also useful if the areas are not too close to local communities. Remember, you are practically conducting a field exercise with the facility security fence as your defensive perimeter.

HIGH TECH

All the common sense that you can muster will not help you swat a mosquito in the dark — nor find and stop a terrorist scuba diver from approaching the naval station harbor at night. Our security department used diver detection devices placed throughout the harbor. These devices are similar to a sportsman's fishfinder, so you obviously should not rely entirely upon their accuracy. Augment harbor security with a system of sentries able to sound the alarm quickly.

"Starlight" night vision scopes are worth the effort of locating. The naval station tower used a scope to identify possible infiltrators along the perimeter of the base.

COMMUNICATION

Communication is the lifeblood of coordination. We used Motorola radios with telephone access. You are on the base so rely on the land-line (telephones) as primary means of communication. Our REACT teams were able to stay informed when dispatched to ongoing situations on the naval stations, but be careful using radio telephones. Let the individual receiving the call know he or she is broadcasting on a radio and not on a secure line. Motorolas can be monitored by anyone. Augment the communication security with proper authentification procedures.

There are many forms of barricades.

SUMMARY

The Seabees' primary peacetime mission is training for contingency construction capabilities. This is the mission of deployed NMCBs as well as CBUs stationed in CONUS. We also keep ourselves trained for defense in contingency situations overseas, but now the threat of terrorism has brought itself to our homefront. After a trans-Atlantic, 10-hour flight, the same group that murdered our Marine Security Detachment in Lebanon could be in our hometown naval station area. It could happen.

Currently there are many naval activities where a group of Seabees may be the only force capable of repelling a terrorist threat. The Secretary of the Navy has already taken steps to restructure the Navy's security forces to strengthen our ability to deter, detect, and defeat terrorist attacks against service members, dependents, and resources.

Part of this plan includes the assignment of Marines to naval base security departments, increased small arms proficiency of all naval personnel, and training large numbers of Navy personnel as auxiliary security forces.

Seabees have the capability to take the lead in anti-terrorist engineering in the protection of their host commands. We need to be ready. This is a field exercise with all the distractions of an active Navy base, including housing, Navy Exchange, commissary, etc., thrown in to add to the

QA course provides the basics

By DANIEL EVEREST
Industrial Engineer

How do you ensure proper Quality Assurance (QA) for a $25 million per year base operating contract at a remote location like Diego Garcia? To further complicate matters, the enlisted naval personnel (approximately 60) who are assigned duties as Quality Assurance Evaluators (QAEs) at Diego Garcia are only on a one-year tour of duty.

Before answering the question, the purpose and goals of a QA program should be discussed. When the government purchases goods and services, even on a location as remote as Diego Garcia, some means are required to attest to the value received for monies spent. The government must be able to confirm that the quantity and quality of goods and services received conform to contract requirements. The QAEs develop and implement procedures that check or test to ensure that the government is getting what it contracted for.

Formal QAE training is offered at least twice a year on Diego Garcia by the Pacific Division (PACDIV), Naval Facilities Engineering Command (NAVFAC). This is a one-week course provided to QAEs who have not been formally trained in the use of quality assurance and surveillance techniques.

A QAE generally takes the first available formal training course after arriving on Diego Garcia. Upon successful completion of the formal training course, the QAE is given a certificate of completion by NAVFAC.

Unfortunately, sometimes there are many months between the arrival of a new QAE on-island and the offering of the next NAVFAC QAE course. In the past, the new QAE would have to rely solely on his or her predecessor (while still on-island), peers (if not too busy), or superiors to help get "up to speed." This type of indoctrination could prove to be inconsistent and possibly incomplete.

For this reason, NAVFAC has developed the introductory QAE training course consisting of a self-paced QAE training manual with supplementary video cassettes. This introductory QAE training course is a condensed and simplified version of the formal QAE training which the QAE attends at a later date.

Through this course, the QAE is individually introduced to the requirements and responsibilities of a QAE on Diego Garcia. Principles of QA and contract surveillance and how to satisfactorily apply them on the job are learned. QAE knowledge is further enhanced when the QAE attends the formal QAE course, but this introductory course provides the basic information necessary for the QAEs to get started as a Diego Garcia QAE.

The response to this self-paced introductory QAE training course has been positive. The self-paced QAE training manual with video cassettes is planned for use by PACDIV, NAVFAC, at other remote locations and may be made available to other interested public works organizations. □

Continued from preceding page

Barricades properly placed impede traffic approaching and leaving the gate house.

challenge.

It is not the intent here to suggest that Seabees assume the duties of the local security departments, but to use our engineering and defensive abilities to enhance total Navy security against terrorists.

Anti-terrorist tactics should be added to combat skills training or established as a separate course. This would preent Seabees from reliving the lessons learned of other units and help us to help our host commands. The threat is upon us, so let's prepare for it. □

Breakthrough for paperless data base at Pearl Harbor Public Works Center

By GORDON MATSUSHITA
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Until recently, it was customary procedure to store information for future use on paper, mylar, microfilm, and other space-consuming media. Maintaining up-to-date records of reports or detailed drawings required changing the original document and then manually making sure that changes were correctly reflected in all working copies regardless of the medium used. This resulted in redundant sets of files filled with large map sheets and allocation of large storage spaces.

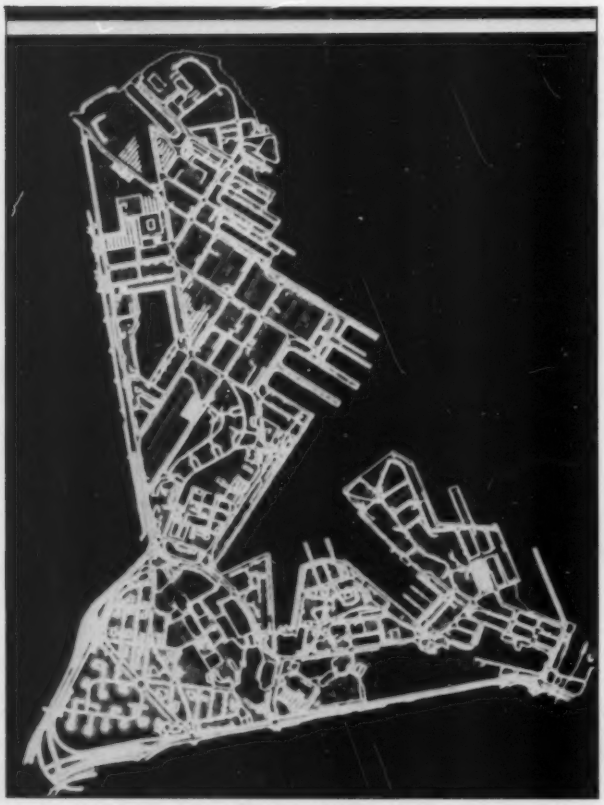

Figure 1. Computer drawing

Handling four or five utilities simultaneously on one drawing can be quite cumbersome. However, if the information is captured on a graphic data base, the desired information can be retrieved by all concerned relatively instantaneously for use or updating. The Naval Facilities Engineering Command (NAVFAC) has on hand many graphics-capable computers (Computervision CADDS 4X) located at the engineering field divisions, public works centers, public works departments, research centers, and shipyards.

A great effort is being made by NAVFAC to convert as much information as possible from paper files to the computer graphic system under the Graphic Engineering and Management System (GEMS).

In September 1985, the utilities department of the Pearl Harbor Public Works Center initiated a bold effort to transfer all the utility systems information, including the buildings, roads, shorelines, textual data, etc., onto the computer graphics system. The areas selected were Pearl Harbor Shipyard, Submarine Base, Naval Supply Center, and Naval Station covering a combined area of approximately 1,000 acres (Figure 1). The final submittal of the project was in November 1986.

Following field surveys to set up control points, the digital map coordinates of the project area were obtained by aerial photogrammetry to an accuracy of $1'' = 40'$. The stereo photographs obtained from aerial photogrammetry were used to digitize major features of the project area in a three-dimensional coordinate system.

The stereo photogrammetric, three-dimensional data base was edited and various features were separated and put on a neutral tape format. This information was then translated into the computer graphics format. For this project, only the horizontal coordinates were utilized. Black and white photographs of the project area, along with color photos, were obtained to help with the edit-

ing and finalizing of the graphic data base on the computerized system.

While the aerial survey data was being prepared, work was in progress to prepare a portion of the intelligent data base which consists of all related information other than that contained in the graphic data base. General Development Maps, Navy Facilities Asset Data Base (NFADB) at FACSO, mainframe computer files, specialized reports, schematics, and utility drawings were used to construct the intelligent data base.

The intelligent information for the utility system (freshwater, saltwater, steam, compressed air, sanitary sewer, POL, electrical, and telephone) was organized using relational data base software and desk-top personal computers. This information, contained on floppy diskettes, was transferred to the computer graphics system. This innovative technique is the only practical and cost-effective way to input large amounts of data accurately and efficiently.

Using commercial software and specially developed graphic programs, the digital maps were enhanced with the intelligent information data base. The data base was constructed utilizing the NAVFAC-recommended symbols, layer listing, etc., wherever applicable. Where the required standards were not available, new symbols and procedures were created. Over 40 graphic symbols were generated for this project and are offered for use with the NAVFAC symbol library. Since the data base is large, each utility system was put on a separate part; 10 separate parts were constructed to describe the entire project. This resulted in an average entity count of 20,000 for each utility system. An entity is any item which defines the model, i.e., points, lines, arcs, text, strings, model lines, etc. The total intelligent data base is over 4.6 megabytes.

It is envisioned that the graphics data base for the stations at Pearl Harbor will have unlimited use in the future

Combining the total graphics capabilities of an enhanced IBM PC/AT with Computervision workstations and the CADDS 4X software and graphics programming languages produced dramatic economies and efficiencies in generating and managing a very large combined intelligent and graphic data base. For instance, 1,300 ductbanks and manholes were located on the graphics model. Each ductbank has about 15 ducts (maximum is over 30). Information on each cable in every duct is stored in the data bank ready for instant retrieval.

The advantages of this combined intelligent and graphic data base for the management of utility systems are significant. Now there is one data base that can be continuously updated and used by all departments. Customized maps related to maintenance and new engineering projects in any scale for any portion of the area with

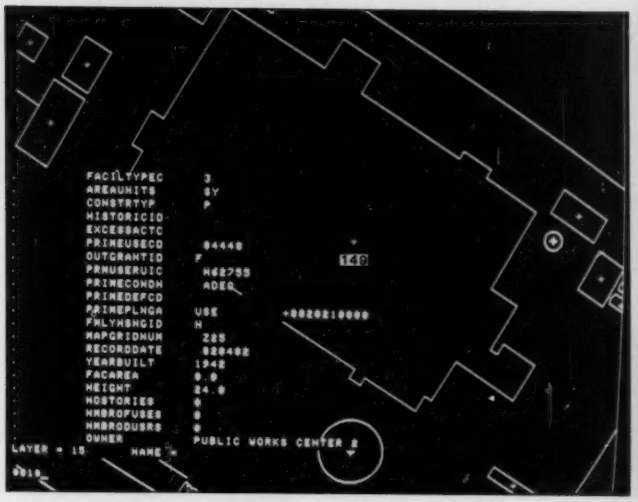

Figure 2. Computer drawing

selected information from the map data base can be produced in a short time.

Color graphics can be included when the map is plotted. Measurements needed for engineering and maintenance projects can be obtained directly from the graphic data base using CADDS commands. The system can be queried for logical responses with the results depicting various reports and drawings.

NAVFAC recommended that 24 selected data elements on building properites from the NFADB be extracted for each of the 1,020 buildings and included in the data base. Now, if a computer graphics symbol at the center of any of these buildings is digitized, the properties will appear on the screen (Figure 2). Similarly, if a similar symbol at the center of any of the electrical ductbanks is digitized, 48 properties appear on the screen, providing instant intelligent information on the ductbank.

Even before the project was completed in November 1986, the data base information on compressed air was being utilized by the Production Engineering Division. The data base is also being used to create general development maps for contractors. It is envisioned that the graphics data base for the stations at Pearl Harbor will have unlimited use in the future. Not only can it be used by the utilities department of the Public Works Center, but by all interested parties, such as the maintenance engineering department, maintenance department, and facility planning department.

Outside the Public Works Center, the data can be used very efficiently and effectively by the Pacific Division, NAVFAC, and the shipyard personnel. If someone is evaluating the locations of all of the utilities at an intersection, a procedure has been established to isolate this area and recall a few or all of the utilities onto this area from the individual parts.

The final submittal was quite extensive and is presented in six volumes. A brief description of the contents of each volume may be obtained from the editor by telephoning Autovon 360-3104/3105, or commercial (805) 982-3104/3105. □

Fourteen graduate basic class at CECOS

Fourteen naval officers — all members of Basic Class No. 182 — graduated from the Naval School, Civil Engineer Corps Officers, Port Hueneme, Calif., on June 5, 1987. The class completed eight weeks of specialized training pertinent to the Navy's needs for shore installation engineering, public works management, and Seabee operation. All graduates accepted work assignments located in various parts of the world.

Guest speaker for the event was Captain James E. Greenwald, CEC, USN, Commander, Western Division, Naval Facilities Engineering Command, San Bruno, Calif. A coffee social for dependents, relatives, and guests of the school staff and students was held in the school lobby prior to the graduation ceremony.

Two class members finished with honors. Ensign Craig A. Fulton was the outstanding graduate, and Lt.(jg) Tracy D. Hofmann graduated with distinction. Ensign Fulton's photograph is indicated by an (°), and Lt. Hofmann's with a (•).

°Ens. Craig A. Fulton
BSME/Colo. School of Mines to OICC Far East CO, Iwakuni, Japan

Ens. Katherine L. Barnes
BSPTE/Univ. of So. Calif. to WNAVFACENGDIV CO, MCAS Yuma, Ariz.

Ens. Scott W. Ayers
BSME/Auburn Univ. to NAVFAC Adak, Alaska

Ens. Chi Man K. Cheung
BSIE/N.Y. State Univ. to OICC Far East CO, Okinawa, Japan

New family housing inventory system makes more efficient plans and budgets

By HOWARD K. OKUMURA
Housing Management Specialist
Pacific Division
Naval Facilities
Engineering Command
Pearl Harbor, Hawaii

Members of the Pacific Division, Naval Facilities Engineering Command (PACDIV) housing division, working with personnel from other commands, have developed a computer program that will eventually enable them to do better and more efficient maintenance plans and budgets. The microcomputer application, now in the field testing stage, establishes a data base for family housing programming and budgeting decisions. The Family Housing Microcomputer System was designed as a management tool to assist housing activities with their housing programs.

The problem that spurred development of the system was the necessity of identifying housing maintenance and repair backlog. The records concerning past maintenance work were fragmented and not complete enough to be of much help. This hampered the managers — they first needed to know when and what maintenance had been done before they could plan for any facilities maintenance.

Before the advent of fast, low-cost, high-capacity microcomputers there were no strict requirements to have this information located in one place. As one housing staff member put it, "we lost too much time searching too many partial records only to discover much of the information needed just was not available."

To correct the situation, PACDIV devised the concept of a data base for family housing inventory. Simply put, the housing data would be automated and contained in a single file. A team led by PACDIV staff and assisted by the Pacific Fleet Data Processing Service Center (DPSCPAC) developed applications so that housing staff could manage the records in the data base. The goal was to create a user-friendly, menu-driven computer program that would serve housing's needs quickly, easily, and simply.

The data base management system selected for the application was dBASE III by Ashton-Tate with the belief that this product could best be adapted to the task. Upon DPSCPAC's recommendation, PACDIV designed programs to run on IBM PCs and compatible microcomputer systems.

The first task was to determine the elements to be tracked. These had to be reasonable work items, not too detailed nor too general, to be useful in decision making. As an example, "bathroom plumbing" was more acceptable than "lavatory piping" (too detailed) or "water system" (too general). Of special interest is the record structure that ensued for the family housing data base. All the information on each typical housing unit is called a record. There were 63 items or fields tracked by housing

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Lt(jg). Francois E. Forman
BSME/Univ. of Md. to OICC Far East, Yokosuka, Japan

Lt(jg). Thomas C. Lvetzow
BSME/Univ. of Wis. to WNAVFACENGDIV CO, San Diego, Calif.

Ens. William R. Dobson
BSPTE/Univ. of Tulsa to LANTNAVFACENGDIV CO, Jax, N.C.

Ens. Scott Nielsen
BSCE/Univ. of Wash. to WNAVFACENGDIV CO, MCB Camp Pendleton, Calif.

•Lt(jg). Tracy D. Hofmann
BSME/Ohio State Univ. to WNAVFACENGDIV CO Office, El Toro, Calif.

Ens. William E. Jonvin
BSME/S.D. State Univ. to PWC San Diego, Calif.

Ens. Tran V. Nguyen
BAEM/Univ. of Minn. to WNAVFACENGDIV CO, MCB 29 Palms, Calif.

Capt. Krirkkiat Ruckphaopunt
MSME/S.W. La. Univ. to Royal Thai Army

Ens. Gregory S. Smith
BSPTE/Texas A&M Univ. to WNAVFACENGDIV CO, Pt. Mugu, Calif.

Ens. Michael A. Zanelli
BSCH/Penn. State Univ. to WNAVFACENGDIV CO, Pt. Mugu, Calif.

managers for each record.

The real work started with prototype testing. With the applications in place, the system had to be loaded with data and tested for reliability. To speed up data collection and program testing, a smaller activity was preferable to a larger one. For this reason, the team decided Pacific Missile Range Facility (PMRF) at Barking Sands, Kauai, with 56 housing units, and closest to PACDIV, would serve as the best prototype.

That's when the team approached Lt. Darrel Sisk, PMRF Public Works Officer, who manages family housing on the island of Kauai. He agreed to automate his files so current status of the housing inventory could be completed. A PACDIV team went to Kauai and collected data on site from facility history folders, special project folders, plant property records, engineering service request chits, appliance records, and house-to-house inspections. The system was then tested and the programs were "debugged."

Initial testing showed the system to be easy to use by noncomputer-oriented personnel. Data manipulation and retrieval were simplified by using menus displayed on the computer monitor. The menus allow the user to select various ways of changing the information and asking for specific data without having to learn all the nuances of dBASE III.

Data can be updated or modified, and meaningful reports may be generated in a highly useful format. The reports are particularly helpful for short- and long-range maintenance planning, repair/improvement project formulation, furnishings procurement, and budget development and execution.

The new system was not easily integrated into housing offices with other than IBM-PC compatible systems

A nontechnical user's manual was drafted to help train managers in the use of the system. After a short time, family housing staff were able to utilize the menu-driven system with ease.

The big lesson learned was that the new system was not easily integrated into housing offices with other than strictly IBM PC-compatible systems. The Air Force/Navy microcomputer contract may produce some light at the end of the tunnel. The Zenith 150 and 200 series microcomputers are IBM PC compatible. Especially recommended for its moderate cost, speed of processing, ease of use, memory size, and storage capacity is the Z-248 which will easily run the housing data base programs.

This, however, does not solve the problems of housing activities with austere budgets. PACDIV has recognized the shortcomings and limitations of less powerful computers at some housing sites. A possibility is to use the Fox and Geller software tool called "Clipper" to compile (the process of breaking down second or third level program language into machine language) programs written in dBASE III and saving it so that the computer can bypass the emulation process each time the program is booted. The system will boot up and run faster and require less memory.

Charles McClure, PACDIV housing division director, who has supported the project since its inception, states, "We are providing the Family Housing Microcomputer User's Guide and the Housing Data Base Applications software to Richard Hibbert, NAVFAC technical advisor and chairman of the Family Housing Personal Computer User's Group so that it may be shared with other engineering field divisions." PACDIV also plans to export the software to other field activities in the near future. □

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Current issues in the Real Property Management Field

THOMAS R. CRABTREE
Facilities Manager
Headquarters of the
Commander in Chief
Norfolk, Va.

The policy of the Commander in Chief, U.S. Atlantic Fleet (CINCLANTFLT) Real Property Maintenance (RPM) program is to allocate scarce resources to the operation, maintenance, and repair of those lands and facilities which have the greatest impact on mission readiness. This is accomplished through the management functions of planning, execution, and control.

The CINCLANTFLT RPM planning process focuses on establishing finite objectives in all functional areas of facilities management including: resource management (Chief of Naval Operations (CNO) Shore Facilities Life Extension Program (Shore FLEP)), inspection programs, work control, performance appraisal, organization and staffing, utilities operations/energy conservation, and civil engineering support equipment. All objectives are designed to measure progress toward improved readiness, effectiveness, responsiveness, and productivity.

Execution is a multi-faceted process. It involves resource allocations, Backlog of Maintenance and Repair (BMAR) management subordinate motivation, and overcoming bureaucratic obstacles. The primary purpose of the execution process is to deliver resources (personnel, fiscal, etc.) toward achieving established objectives.

There are three significant factors in the execution process that affect the efficient use of RPM funds. One factor is late or nonexistent appropriation bills and the resultant use of continuing resolutions. This creates major funding uncertainity at the activity level.

As a result, activities postpone funding which is most easily postponed, e.g., RPM. Ultimately, by late third quarter or early fourth quarter when the funding posture becomes clearer, there is a great rush to spend to meet the assigned maintenance floor. This floods the contract bidding market, which drives prices up.

Also, when a disproportionate number of contracts are awarded in a short timeframe, a larger number of contractors are on the base at one time. Scheduling (laydown areas, pier/facility availability, etc.) becomes more difficult and base operations and physical security are degraded.

Another factor is failure to fully fund the RPM requirement which results in an ever-increasing "fixed cost of base ownership." A common misconception is that every RPM dollar provided to an activity is available for BMAR reduction. This is not the case. In fact, only about 30 percent of each RPM dollar provided to an activity is available for BMAR reduction. The remaining 70 percent goes to cover the "fixed cost of base ownership," i.e., cyclical workload and overhead.

This is further compounded when program cuts are distributed. For example, if a base receives $1,000,000 in RPM, then $700,000 would go to cover the "fixed cost of base ownership" and 30 percent would be available at the commanding officer's discretion to be applied to reducing the BMAR.

Assume an activity's pro-rata share of an RPM cut was 10 percent or $100,000. By their nature fixed costs must be covered and cannot be impacted. Therefore, what was a 10 percent ($100,000 : $1,000,000) cut is actually a 30 percent ($100,000 : $300,000) reduction in the commanding officer's discretionary funds available for BMAR reduction.

The final factor is the RPM floor concept. It is a very important factor in the execution process and has a positive effect on the efficient use of RPM funds. CINCLANTFLT fully supports the RPM floor concept and distributes a portion of the floor to each Echelon III commander when funds are distributed. Deviations from the floor must have specific prior approval.

Three indices are used to refine the resource allocation process. The first is the Facility Conditions Index, a ratio of activity backlog to current plant value; it is used as a barometer of facility condition. In Facilities Evaluation Assistance Team (FEAT) visit reports, activities are provided with a listing of their facilities broken down by investment category. Within each investment category, facilities are arrayed by Facility Condition Index.

This allows the public works officer to quickly determine which facilities in the primary emphasis investment categories are in the worst condition and plan appropriate corrective actions. The next index used is the Asset Protection Index.

The Asset Protection Index relates maintenance and repair funding to the taxpayers' investment in facilities. The Asset Protection Index is used to assess proper RPM funding levels. By looking at the

Asset Protection Index and Facility Conditions Index together, you can make an appraisal of reported requirements versus planned funding by investment area and facility.

The primary aim is to initiate corrective action in areas with increased BMAR, particularly those specified as emphasis areas by the CNO or CINCLANTFLT. The final index used is the Funding Index which quantitatively relates planned activity funding to requirements.

The Funding Index is the "planned funding" divided by the "total requirement." These indices are used by the CINCLANTFLT and Echelon III staffs as management tools to help apply resources to planned goals.

BMAR management is another key element of the execution process. The initial step in BMAR management is documentation through the Controlled Inspection Program (CIP). The Annual Inspection Summary (AIS) is an outgrowth of the CIP and is used as *the* source document for RPM requirements in the budget process. Through the AIS, BMAR is, in effect, zero based each year.

Once BMAR is documented in the AIS, it is arrayed for execution in the activity maintenance action plan with priority given to high-emphasis investment categories.

The degree of confidence in BMAR as a method of measuring maintenance requirements is high. The AIS is field-validated by staff engineers during FEAT visits. Therefore, what is reported is considered accurate. However, due to the difficulty associated with inspecting underwater facilities and utilities, deficiencies in these areas are probably underestimated.

Despite efforts to manage and prove the creditability of BMAR, it is not held in high regard by Congress as a measure of RPM resource requirements. One reason is that when extra resources are applied to the RPM program BMAR sometimes goes up instead of down. There are two probable reasons for this. The first reason is the "cost of base ownership" concept addressed above.

The second reason is called the "increasing returns phenomenon." This phenomenon results from the public works officer perception of payback for resources invested. As RPM resources become more and more scarce, the public works officer will apply an engineeering design, estimating, and inspection resources to the areas from which the greatest return is expected.

If the funding environment for RPM is perceived to be poor, then he/she will *not* spend a lot of resources documenting deficiencies that may not get funded. Conversely, when significant levels of resources are put into the system, the public works officer's perception of payback for resources invested is changed and he/she responds by more thoroughly documenting deficiences.

Views presented here are a summary of those given before the House Appropriations Committee

If funds continue to be put into the system, this perception is reinforced and he/she will continue to document deficiencies. This is why BMAR goes up when funds are provided sporadically.

Even in a dedicated and stabilized funding plan as envisioned in Shore FLEP, BMAR should be expected to increase in the first and possibly the second year but would then decline in subsequent years.

Thus, if significant inroads in BMAR reduction are to be made, it will only be possible with a systematic funding plan such as outlined in Shore FLEP.

In the execution process, the question of what is a manageable level of BMAR comes up. By definition, nondeferrable deficiences which make up BMAR should always be zero.

Theoretically, one should identify anticipated deficiencies and plan corrective action so that on the day that a deficiency would have migrated from deferrable to nondeferrable it was in fact corrected.

Based on this theory and given the programming and design times dictated by regulation and law, ideally we should always carry a 12- to 18-month backlog of deferrable repairs and no BMAR backlog.

CINCLANTFLT uses modern organizational behavior techniques as positive inducement for subordinates to achieve fleet goals. Activities receive positive command recognition for notable achievements and initiatives in facilities management. Communication is a vital element of the motivation/behavioral modification process.

A quarterly CINCLANTFLT facilities management newsletter is used to advise all echelons of command of new and innovative actions in facilities management as well as to recognize notable activity accomplishments.

Measurement of actual performance to plan, which is the essence of the control function, is accomplished by the review of a broad spectrum of documents and actual on-site visits by CINCLANTFLT and Echelon III representatives in conjunction with FEAT. AIS, POM, and budget documents are reviewed in detail to ensure accuracy and conformity with established objectives.

Once these documents have been reviewed, detailed individual feedback letters are provided to each activity outlining problem areas and required corrective action.

A vital part of the control process are the CINCLANTFLT and Echelon III visits to activities made in conjunction with FEAT visits. During FEAT visits, staff engineers review all functional areas of facilities management.

This includes assessing facility condition and evaluating resource requirements/management, identifying current and potential problems and necessary corrective action, and furnishing on-site training in critical areas.

The FEAT visit report is a valuable management tool outlining specific actions, in priority order, that an activity needs to take to

Continued on page 19

Navy couple CEC officer/GS

Lori and Stephen Knapowski talk over the advantages of a new type of surface for a tennis court at the Great Lakes Naval Hospital.

Stephen and Lori visit a worksite — the 13th floor of the Navy Hospital where a new roof will be installed soon.

Steve and Lori discuss the new tennis court surface.

Lori and Construction Contracts Department Head, Lt. Jay Miller, go over specs.

The continuity of meaningful employment for military spouses is an increasing concern to many Navy families. There's enough to think about when Permanent-Change-of-Station (PCS) time rolls around without having additional stresses in searching for another job at a new duty station. The Navy is interested in easing the strain and recently announced that guidelines are being developed to expand provisions for preferential selection of Navy spouses in state-side civil service jobs graded at GS-5 through GS-7.

Two young Civil Engineer Corps (CEC) couples at Great Lakes have another effective way to avoid this now often-encountered situation in Navy families. Mrs. Leslie Wiegand, wife of Lt. Francis Wiegand, and Mrs. Lori Knapowski, wife of Lt.(J.G.) Stephen Knapowski, have taken advantage of the Naval Facilities Engineering Command (NAVFAC) Professional Development Center (PDC) Program.

This program provides for hiring college graduates into junior professional positions, providing them on-the-job training and advancement in order to meet any professional manpower requirements of two to three years in the future.

Better still, these CEC wives took advantage of the program as PDC interns in the engineering field. Since the government historically has difficulty in filling and retaining engineer positions, a civilian engineering job will frequently be available at CEC duty stations.

Leslie Wiegand began her NAVFAC career even before entering the PDC program. She was a student engineering aide in the San Diego Resident Officer-in-Charge-of-Construction Office while attending San Diego State University. That's where she met her husband, Francis, serving his first CEC tour of duty as an AROICC. After receiving her B.S. degree in mechanical engineering in May 1983, she was accepted for an opening in the San Diego Public Works Center Career Management Intern Program (the local PDC program).

"The Public Works Center (PWC) (San Diego) program was great. While initially hired into Code 101, I spent time in every PWC department and learned a great deal about the whole organization," she said. "This has helped me in my job here; I have a better understanding of the organization and how I fit into it. Knowing where to go in the organization for information and other things is very helpful in everyday functioning on my job," she added.

Just as Leslie was completing her PDC program in June 1985, the Wiegands received orders to Great Lakes. Leslie explained the ease of the move, "I used two weeks of my leave and reported here (the Public Works Center Production Engineering Division) as a GS-11 mechanical engineer."

Lt. Francis Wiegand, Staff Civil Engineer for Naval Medical Command, Northeast Region, a third echelon command headquartered at the Great Lakes Naval Training Center, thinks his PWC engineering partner is an asset. His job of planning and coordinating all maintenance, repair, special project, and military construction work for 44 medical facilities in the 19-state region brings him in frequent contact with the Public Works Center.

Having first-hand insight of what's going on at the PWC helps me in funding jobs for the medical

les benefit as S. engineer teams

command," he said. "By sharing information of common value, our experiences in different activities as well as in different engineering fields allows us each to learn from one another," he added.

"The Navy benefits from this relationship too," he conveyed. "During interesting talks at the dinner table and professional discussions on the job, I learn a great deal about her specialty (mechanical engineering and ventilation and steam systems) that assists me in my civil engineering background."

Preparing for another move this summer, the Wiegands know they do not have to worry about hunting for a job for Leslie. Now a career civil service employee, Leslie will receive preference for any engineering job vacancy at their next duty station.

When Lt.(J.G.) Stephen Knapowski reported to Great Lakes as Staff Civil Engineer for the Naval Hospital, his wife Lori was seeking a civil engineering positio for herself. The Wiegands explained the advantages of the PDC program, and Lori applied to the Office of Personnel Management to be included on a register for engineers. She applied and was accepted for the PDC program through NAVFAC headquarters. In February 1986, she began her internship in the Production Engineering Division of PWC Great Lakes.

Because the Michigan Tech. graduate had previous work experience with a commercial architect and engineering firm, she entered the program as a GS-7 rather than a GS-5.

"I've been pleased to be a part of the PDC program," said Lori. "The intern program is a good way to gain needed experience for a Navy engineering job." She explained, "I've been in design engineering for a year, will be in the ROICC office for the next six months and then go to facilities planning. I'm looking forward to getting construction experience in the ROICC office," she said. "And," she added, "progressing from a GS-7 to a GS-11 in two years provides incentive."

Lori's husband and fellow civil engineer appreciates being able to go home and discuss his job with someone. "She knows what I'm talking about and I know what she's talking about," says Steve. "That allows us to grow in our jobs and help each other when our professional paths cross."

The Knapowskis are due to rotate from Great Lakes in December of this year. They are hoping for assignment in the Pacific Northwest, where there would be many civil service opportunities for Lori as a civil engineer.

Holding a job in their chosen field is extremely important to these professional women. Sharing similar educational backgrounds with their CEC husbands provided the key to satisfying that preference.

The opportunities for civilian engineers within the Naval Facilities Engineering Command allows them the continuity to fulfill a full-time federal career. And the PDC intern program facilitates their development into an integral part of the Navy's engineering team. □

Story and photos
By RUTH BETH
Public Affairs Specialist
Navy Public Works Center
Great Lakes, Ill.

Lt. Francis Wiegand and wife Leslie go over a drawing for improvement to the command's headquarters building.

Lt. Wiegand explains money needs to his superiors in the Medical Command Office.

Leslie plans jobs for Naval Medical Command in the PWC Maintenance Engineering Department.

Leslie and Francis share information for a project to move a large generator fan to the outdoors.

Full Seabee team effort essential in meeting 'needs of the fleet'

By LT BRUCE F. DAMMEIER
CEC, USN

Rarely during the normal course of our Civil Engineer Corps (CEC) business do the four different aspects of the CEC (Seabees, Public Works, ROICC, and staff) get to work side-by-side to see an endeavor to completion.

In October 1985, Adm. J. A. Lyons Jr., Commander in Chief, U.S. Pacific Fleet (CINCPACFLT), asked RAdm. J. N. Darby, Commander, Submarine Forces Pacific Fleet (COMSUBPAC), what he would require to provide a stronger submarine presence in the Northern Pacific to counter the growing Soviet surface and subsurface threat in the region. RAdm. Darby replied that one key requirement was to be able to conduct minor submarine repairs or refits at the Naval Complex in Adak, Alaska. This maintenance capability would significantly increase the time on station for the Pacific submarine force by reducing the number of return trips as well as transit time to Pearl Harbor or San Francisco for upkeep.

LCdr. Donald B. Hutchins, COMSUBPAC's Civil Engineer, worked with other members of RAdm. Darby's staff to define a project to provide Adak with an all-weather, cold-iron capability, and shop facilities specially equipped and tooled to service submarines.

The project consisted of two insulated pre-engineered buildings (PEBs); a 40 foot by 100 foot shop facility including offices, a head, and special mechanical and electrical utilities to accommodate the tool/equipment considerations. The cold iron capability was provided by a 40 foot by 50 foot facility to house two 750 kw MUSE generator units including 1,500 lineal feet of conduit and cabling run underground to the submarine pier.

The urgency of the projects necessitated a tight completion schedule that did not permit for routine contract timeframes. Seizing the opportunity, RAdm. A. W. Fort, Commander, U.S. Construction Battalions Pacific Fleet (COMCBPAC), accepted the challenge with a Seabee "can do." CINCPACFLT then issued a message establishing a Plan of Action Milestones.

With the tasking message out, the players were assigned. The overall coordination of the project fell to LCdr. Robert L. Phillips in COMCBPAC. Messrs. Tom Moore and Scott Nelson in the Pacific Northwest Branch Office of NAVFAC's Western Division (WESTDIV) were tasked as the project manager and engineer-in-charge respectively and were responsible for meeting the design deadlines.

Procurement of the project material fell to the newly established Deployed Project Support Department (R70) under Lt. Alan M. Terpolilli of the 31st Naval Construction Regiment (NCR). The construction of the project was tasked to the Naval Mobile Construction Battalion Five (NMCB-5) Detachment, Adak, which had deployed there in February 1986.

The construction organization consisted of: Lt. Paul M. Kuzio, Detail Officer in Charge (OIC); Lt. Bruce F. Dammeier, Detachment Assistant OIC/Operations Officer; BUC Robert J. Kunka, Projects Chief; and BU2 Wes N. Minster, Project Supervisor.

With the major players set, the "fast track" project began in earnest. The PEBs were ordered based on the project scope prior to the completion of the design. As soon as the 100 percent drawings were available in April, the 31st NCR began ordering material and NMCB-5 continued project planning. Allowing for anticipated material delays, this planning revealed that construction had to start in May in order to meet the October completion target.

To assist in expediting material, NMCB-5 developed a critical material list and established required delivery dates. This list consisted principally of the long lead mechanical and electrical equipment. Close coordination between NMCB-5 and the 31st NCR identified additional material which was subsequently ordered with minimal delays.

RAdm. Darby emphasized the criticality of the project by visiting Adak in May 1986, just as the foundation excavation was starting. In June, full-scale construction began with the arrival of the bulk of the reinforcing steel and the building components by barge. When the underslab mechanical piping failed to

arrive in time, the local "CEC family" pulled together as the public works departments at the Naval Air Station, Naval Security Group Activity and Naval Facility all pooled their resources to keep the projects on schedule. The Resident Officer in Charge of Construction (ROICC) for the projects, headed by Ens. Matt Foster and Messrs. Gerry Rieger and Andy Fuller, ensured that the intent of the design was never compromised as the project was adapted to utilize available material.

On the project, BU2 Minster demonstrated both exceptional management ability and leadership. He kept his 22-man crew motivated and the project on schedule despite severe material constraints and 12- to 14-hour workdays. To keep the projects moving, BUC Kunka was the "on-island" material coordinator. In this capacity, there was not a single piece of potentially useful material in any back room or storage lot on Adak that he had not mentally cataloged for future use. Simultaneously, Lt. Dammeier tracked all "off-island" material, which required at least daily phone calls to Port Hueneme.

As with all "hot" projects, these two had more than their share of major problems. Both PEBs were ordered through a GSA contract. The contractor brought together components from three separate suppliers, one for the frame and roof, another for the siding, and yet another for the roof insulation. Predictably, the whole package did not fit together very well.

The siding did not match the framing and neither matched the design. The framing had to be revised; new members were fabricated on site by SW2 Terry L. Clary and the siding was pieced together like a puzzle. Then, it was discovered by the ever-present Adak environmental conditions that the designed deflection in the roof panels under high winds was incompatible with the rigid roof insulation.

Action	Responsibility	Completion
Design	WESTDIV	April 1986
Material on site	31st NCR/ROICCPAC	June 1986
Construction	COMCBPAC	October 1986

Plan of Action Milestones

After a site visit, the roofing manufacturer authorized the Detachment to penetrate the roof with additional fastening screws to reduce panel deflection and revise the support system for the insulation. Although these were obvious deficiencies which should have been corrected by the supplier of the PEBs, normal contracting procedures would have delayed completion beyond an acceptable date.

The final hurdle to overcome came in the form of material procurement and delivery delays. Even with the critical material list provided by NMCB-5, it became apparent that the normal supply system could not provide several long lead items to keep up with the construction schedule.

The key items were the 500 KVA transformer, the furnace, and the exhaust system. To solve this problem, LCdr. Phillips enlisted the assistance of LCdr. Hutchins and the submarine force expediting "kings," the Polaris Missile Office, Pacific (PMOPAC). This office is the organization that can obtain critical support material seemingly overnight to support the submarine fleet. With their help, these critical components arrived literally "in the nick of time."

The final inspection of the facilities was held on October 20, 1986, and RAdms. Darby and Fort arrived that afternoon for the ribbon-cutting the following day. RAdm. Fort passed on a hearty "well done" and presented a Navy Achievement Medal to Petty Officer Minster. RAdm. Darby also lauded the crew for their efforts, explained the significance of the facilities to the submarine fleet, and presented letters of commendation to project crew leaders.

The following day, October 22nd, NMCB-5 Detachment Adak's advanced party returned to Port Hueneme, Calif., tired but satisfied at the conclusion of their long deployment.

Needless to say, many of the major players in this modern-day "miracle" of facilities procurement gained a few gray hairs in completing the project. However, not one would have given up the opportunity to be a part of such a high priority fleet support project where the CEC/Seabee family jointly fostered our "can-do" reputation.

□

Real Property Management

Continued from page 15

By aggressively applying the management principles and tools indicated, it has been possible to increase the percentage of facility special project dollars (centrally managed at CINCLANTFLT) spent on BMAR from 65 percent in fiscal year 1984 to 85 percent in 1986.

In fiscal year 1987 and beyond every effort will be made to cut the "fixed cost of base ownership" through improved productivity, more efficient utility operations, reduced overhead, etc.

Even with the significant strides made to date and the continued improvements envisioned, BMAR will continue to grow and mission readiness will decline. This trend will only be reversed by a dedicated and stabilized funding plan such as envisioned in Shore FLEP. improve RPM. Each FEAT visit report is forwarded to the respective activity commanding officer by a CINCLANTFLT letter via the Echelon III commander.

Aggressive application of sound management principles is absolutely essential to effective and efficient RPM management. Since its conception, the FEAT visit program has saved approximately $12 million by redirecting resources to more productive, mission-essential areas.

□

news worth reviewing

New method ensures proper coating on buildings

The Navy, through better chemistry, has developed a method to ensure the application of the proper coatings on military buildings.

The military services need an acceptable method to determine the quality of paints before starting major paint jobs. Lacking were simple field tests to determine if coatings were of suitable quality for satisfactory application and performance. Such tests were needed especially for paints that had been stored for some time or had been purchased locally over the counter.

To solve the problem, the Naval Civil Engineering Laboratory, Port Hueneme, Calif., developed a portable field kit for testing commercial paints. The kit, the size of a briefcase and weighing less than 14 pounds, can be used by field personnel with no technical training.

The NCEL kit contains the equipment, supplies, and instruction manual (with illustrations) to perform the 14 tests.

Additional information concerning the field test kit can be obtained from the Naval Civil Engineering Laboratory, Port Hueneme, Calif. 93043-5003, or the U.S. Army Construction Engineering Research Laboratory, Champaign, Ill. 61820-1305.

PWC Guam wins Safety Ashore Award

The Public Works Center, Guam, won the SECNAV Safety Ashore Award for fiscal year 1986 in the "industrial" category.

The award cited the PWC's safety exceptional training program, workplace inspection, and resulting low mishap rates.

EO3 Arnold Dupre makes a big splash on a swamp-draining project at Naval Station, Roosevelt Roads, Puerto Rico. Dupre is with NMCB-5.

The Richard Stethems, parents of SWZ(DV) Robert D. Stethem, unveil the bronze plaque which was dedicated to their son. Assisting are Capt. Q. E. D. Lewis (left) RAdm. H. C. Amos, Jr., Cdr. J. L. Delker, CO of NMCB-62.

Gulfport lodge dedicated to former Seabee

The Naval Construction Battalion Center, Gulfport, Miss., dedicated its newly constructed Navy Lodge in memory of Steelworker Second Class (Diver) Robert D. Stethem, USN, during a special ceremony held here on May 20 according to reporter JOSN Janet Garrett.

Stethem was the young Navy Seabee who was killed at the hands of Shi'ite terrorists during the TWA Flight 847 hijacking in June 1985.

Stethem's parents, Mr. and Mrs. Richard L. Stethem of Waldorf, Md., attended the ceremony and unveiled the bronze plaque dedicated to their son.

Giving the dedicatory address, RAdm. H. C. Amos, Jr., Supply Corps., USNR-R, Assistant Chief of Staff for Supply, Naval Air Force, U.S. Atlantic Fleet, quoted a message from the new Secretary of the Navy, James H. Webb, Jr., "Petty Officer Robert D. Stethem had successfully completed his naval mission around the globe, and we grieve when his love for life was taken by Shi'ite terrorists. Petty Officer Stethem was from a Navy family; a special person with special talents; a steelworker, a diver; the cream of the Navy Seabee corps; a volunteer, hand-picked, highly trained, and totally dedicated." The rear admiral added, "We honor him today with this facility."

Computer programs designed to analyze common problems

A library of easily accessible computer programs, designed to analyze six common structural and civil engineering problems individually, has been developed by NCEL, Port Hueneme, Calif.

Kit Mack began developing the index of information approximately 12 years ago. He said the programs have been tested extensively and have proven reliable in solving daily structural problems facing engineers who work in the field.

Additional information may be obtained by writing to the Laboratory. One-day training sessions may be arranged for Department of Defense agencies.

When engineers become managers...

It's a dual role requiring considerable adjustments for most engineers

By PHILIP R. WINTERS
Naval Energy and Environmental Support Activity
Port Hueneme, Calif.

A Civil Engineer corps captain once said to me, "the best managers in the world are engineers, but, most engineers are rotten managers!" Coming from an engineer this statement had a certain amount of shock value; coming from a person who occupied a senior position in the Naval Facilities Engineering Command — my own organization — made me flinch.

Imagine the implications of his statement. At best, a few of us receive direction from people whose management capabilities are questionable. At worst . . . .

Since I believe the captain's observation is correct, consider some traits that cause an engineer trouble in the role of manager.

First, we are trained in logical thought processes. Each of us wants to understand the likely result of our actions; therefore, we consider alternatives, either subliminally, as part of our thinking, or as written analyses. This is good — up to a point.

If we are the type that selects a course of action as "best" and then demands no deviation, we are likely to get into trouble. Most often we have engineers working for us and they, too, are trained to be logical. If we deny them an opportunity to mold and shape their projects to fit their own capabilities, they will be little more than automatons.

In other words, we must find a way to get the people we supervise to "buy into" the work they are asked to perform. Failing to obtain their buy-in, we will receive their dissatisfaction. High turnover rates, excessive use of leave, and lackadaisical attitudes are likely. We will, of course, find "logical" reasons for our failure to keep our people. Among them are:

- "Salaries on the 'outside' are so high I can't compete." This favorite is a truism. Most federal engineers and scientists receive less salary than their industry counterparts. Yet, before you use this excuse, be sure that other supervisors have the same problem. If you are alone in having high turnover, your argument is probably specious.
- "The cost of living in my area is so high I

Engineers supervise too closely

can't attract people." Again, be careful. If you are the only one having trouble, the word may be out on you. Don't underestimate the depth of unofficial communication. A first-level supervisor who is unhappy has a difficult time hiding the fact. A person interviewing for a position needs to feel enthusiasm and needs to see potential colleagues engaged in productive work.

Second, engineers tend to supervise too closely. When we have been involved in design of a facility, we want to see it constructed as specified. But, people are not facilities. Too much supervision drives down morale. No one wants the boss looking over his or her shoulder all the time. Furthermore, your "little" progress review meetings that occur a couple of times a week might be too much supervision.

An engineer learns that the human equation is complex

The best supervision is no supervision — at least in the stereotypical sense of the word. If you have developed your first-level supervisors — or your employees — the right way, they do not require constant supervision, and they will keep you informed of problem areas when they arise. Too much supervision prevents the employee from "buying in."

Taking an active interest in what your employee is doing will keep you informed without being obtrusive. Whenever possible, therefore, let the employee ask to see you. Then, if you demonstrate sincere interest and ask intelligent questions, your advice will be both appreciated and followed.

Some employees, however, *must* be supervised. They will take advantage of every situation set before them; for these folks act accordingly. But, if you find most of your people fit this description, *you* have a problem.

Third, specifications are the heart of most engineering projects and we hate to see deviations from what we know is correct. Unfortunately, engineers have a tendency to write performance goals as specifications. Annual performance reviews become a matter of "bean counting," in essence, making sure that the correct nuts and bolts were used.

Supervisors who refuse to recognize extenuating circumstances breed dissent and lower productivity. We must be wise enough to set achievable goals, but, more importantly we must be wise enough to know when a goal is truly important. If we establish a due date that is ours and ours alone, does it really matter if the date is met?

The employee knows if the project being worked on is important and if it is due. If you insist on "holding an employee's feet to the fire," make sure you have a valid reason, otherwise you will ruin your credibility — flim-flam does not work!

Fourth, when you change jobs, do not try to make the new organization fit the mold of your old one. Engineers love consistency — after all the First Law of Thermodynamics doesn't change from place to place. Just remember, no matter how great your last organization, your new one is better — at least in the minds of your new colleagues and employees. The first few weeks at a new job must be as a student not a teacher. Each organization has its own personality that has evolved to deal with requirements imposed from above.

If you walk in and try to inject your "foreign" personality, you will learn the meaning of xenophobia. You might even find your people doing it "your way" (grudgingly), but sooner or later — probably sooner — you will find yourself in earnest conversation with your boss, who will tell you to "back off."

As an engineer in a management role, you must learn that while physical laws do not change from moment to moment, the human equation is more complex. In human terms, a multitude of ways exists to solve most problems. If you insist on only your way, halfhearted efforts will be extended to give you substandard products. You will not have obtained the mandatory "buy in."

This elusive "buy in" that you need so much to do a good job is easier to obtain than one might imagine. Just ask yourself "what was the best job I ever had, and what made it so good?" These questions were asked a group at a NAVFAC executive institute session recently, and with more than thirty people responding, the results boil down to the following:

- I was given all the responsibility I could handle — I was my own boss.
- The job was challenging and I was allowed freedom to set my own direction.
- The work was interesting.
- I was allowed to make mistakes.

If you allow your employees an opportunity to design their own approaches to problem solving and goals achievement, you will get them to "buy in." If you don't, you will be one of those "other" engineers who are doomed to fail as managers. □

speaking from topside

The Chief reflects on a long, active career

For thirty-three years as a naval officer, I've been accustomed to leaving a job and moving to bigger and more challenging positions. Now for the first time I'm faced with not only leaving a job but also leaving a career and the United States Navy.

It's no wonder that such a significant change is cause for reflection — reflection on my career and reflection on the state of the Naval Facilities Engineering Command and the Civil Engineer Corps.

Looking back on my career I naturally remember most of the good things and only a few of the unpleasant. Any success I enjoyed has been dependent on the work and assistance of others. I am thankful for the tremendous support I have received throughout my career from our officers and civilians and from our Seabees.

Even more important than my recollection of specific events is my overall feeling of satisfaction and accomplishment that comes from having done my best. I'd willingly trade places with the most junior ensign for the chance to do it again. Regrettably, you only get one chance so I urge you to enjoy your career and have fun along the way. I sure did!

As I reflect on the Naval Facilities Engineering Command (NAVFAC), I see a command which will continue to be faced with tougher and tougher challenges. In construction, public works, contracts, Seabees — in all areas of our business — NAVFAC faces increasing workload in an environment of very limited resources.

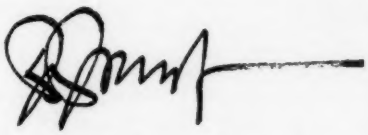
Our job is further complicated by the ever-present personnel system constraints, broad and complex environmental regulations, micromanagement by the Congress, and periodic second guessing from all quarters. Despite this rocky playing field, NAVFAC has performed exceptionally well and will continue to do so.

The success of the Command is a testament to the quality of our people. I have been continually impressed by the superb quality of the people throughout the NAVFAC system. Problems are solved by people, and we have the best problem-solvers in the Navy.

As I reflect on the Civil Engineer Corps, I see a corps which is well qualified to meet the challenge of the future. The CEC is a corps of leaders and professionals. Our officers — from warrant officer to rear admiral — are tasked with demanding and challenging responsibilities throughout the world. Those challenges, starting with an officer's first tour, have produced an officer corps of leaders who seek and thrive on responsibility.

To those I leave behind, I urge you to keep your focus on leadership. Be a leader, and take seriously your responsibility to develop leadership throughout the Corps. Finally, as I noted in an earlier "speaking from topside" column, always be guided by a keen sense of personal responsibility and accountability.

My reflections on career, NAVFAC, and the Corps were brief. After thirty-three years, I've learned to get to the point!



JOHN PAUL JONES, JR.
Rear Admiral, CEC, USN
Commander
and
Chief of Civil Engineers
August 31, 1984 - August 14, 1987

Medical military construction program undergoes streamlining

By CDR FRANK J. KALEBA
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Beginning with 1987, the Services will no longer hold military construction (MILCON) funds for the planning/design (P&D) or construction of medical facilities (generally Dept. of Defense (DoD) Category Code 500 series). Instead, the Assistant Secretary of Defense (Health Affairs) (ASD(HA)) will act as the resource sponsor for all medical MILCON.

The office which will perform these duties for ASD(HA) is known as the Defense Medical Facilities Office (DMFO). The following paragraphs describe the background for this change and what it will mean to field activities and engineering field divisions (EFD).

BACKGROUND

The basis for the transfer of resources was the issuance of the final report of the Blue Ribbon Panel on Sizing DoD Medical Treatment Facilities. The Blue Ribbon Panel was formed as a result of the direction given to the DoD in the Conference Committee Report of the Military Construction Authorization Act, 1985.

The concerns expressed in the Conference Committee Report included the age and condition of military hospitals and clinics, changes in the patterns of the delivery of health care, and the essential relationship of the facility to the quality of care provided. To assess these concerns, a panel of health care experts from outside the DoD was established.

Specifically, the Panel was to review the criteria for sizing military hospitals and to determine the extent to which expanded use of available civilian health care facilities could be employed to achieve cost savings. The Panel convened in January 1985 and issued its final report on June 28, 1985.

In its final report, the Panel issued six principal recommendations. One of those, Recommendation III, served as the basis for the resource transfer:

"III. The review of DoD medical treatment facilities and the selection of candidates for funding as medical military construction projects should be consolidated and streamlined, so that all facilities are reviewed by the Office of the Assistant Secretary of Defense (Health Affairs), which will be responsible for selecting those most urgently needing replacement, modification, or modernization, taking into account the recommendations of the Services, and for allocating resources to those projects."

Under the ASD(HA) charter existing at the time the Panel's report was issued, ASD(HA) had wide authority to approve or defer Service medical construction projects. This authority was exercised through a number of methods: the required ASD(HA) approval of the construction requirement (Format B), the ASD(HA) approval of the proposed sizing (Space Plan), ASD(HA) approval of long-range (FYDP) programming of specific facilities projects (Health Facilities Program Review Board), and ASD(HA) approval and certification of design concepts (preliminary concept plans) and the 35 percent design. But this authority did not extend to controlling the resources necessary to plan and design projects or to allocate construction funds. So, as a result of the Panel's recommendation and its interpretation as a mandate to transfer resources, Program Budget Decision 305C was signed in January 1986.

Program Budget Decisions (PBDs) are part of the DoD's Planning, Programming, and Budgeting System (PPBS) which represent decisions of the Secretary of Defense regarding programming or budget matters. In this case, PBD 305C dictated the transfer of resources from the Services to a Defense agency.

For the Navy, the resources moved include: MILCON funds across the FYDP (FY 1987 through 1991), Operations and Maintenance (O&M) funds (to pay for civilian salaries, economic analyses of medical facilities, etc.), P&D funds (the old "Z-planning account") which pays for plans and specifications, and manpower end-strengths to operate the new Defense organization. The Navy was

required to move six military and seven civilian end-strengths. Of these, the six military will come from the Naval Medical Command (NAVMEDCOM) and the seven civilians from the Naval Facilities Engineering Command (NAVFAC). The Army and Air Force saw similar transfers.

THE NEW DMFO

The receiving Defense Agency is to be known as the DMFO. The DMFO organization will be structurally a part of a Defense Medical Support Activity (DMSA). The DMSA is a DoD field activity under the direction, control, and authority of the ASD(HA), who also serves as the Director, DMSA.

DMSA will have two deputy directors, one of whom serves as the Director of the DMFO and the other serving as the Director of the Defense Medical Systems Support Center (DMSSC).

DMFO, as presently described, will have 37 personnel, roughly 13 from each Service. Its major responsibilities, as outlined in DoD Directive 5136.10, will be:

- *Facility Planning* — reviewing capability of facilities, identifying facilities most urgently in need of replacement, modernization, or modification, and determining the appropriate sizing for all medical construction projects;
- *Facility Programming* — prioritizing projects within a consolidated DoD program, developing justification and documentation to support the facility construction program, and administering and monitoring the allocation of funds for approved projects;
- *Facility Criteria and Review* — developing and maintaining DoD engineering, design and space criteria for medical facilities, performing concept reviews, and providing 35 percent certification of designs.

The operating divisions of the DMFO which will accomplish these tasks will be:

- *Planning Division* — 17 people, headed by a Medical Service Corps (MSC) officer (from one of the Services) in the grade of O-6.
- *Programming Division* — 10 people, also headed by an MSC O-6, split into two branches — a Program Development Branch, with three MSCs (one from each Service) and a civilian program analyst; and a Program Execution Branch, with one MSC/Corps of Engineers/CEC and one budget analyst.
- *Engineering and Design Criteria Division* — four people, headed by a GM-15 general engineer, with an MSC architect, and one other engineer.

OPERATION

Since the new DMFO has just come into being and is not yet (April 1986) fully staffed, the precise flow of paper has not been finalized. But some general points can be described.

First of all, the initial cadre of the DMFO will be made up of military and civilian people who are familiar with medical planning, facility requirements, and solutions. So, they're starting from a solid knowledge base.

Second, the Corps of Engineers and NAVFAC will continue to operate as the design and construction agents. The change will be that instead of executing their own Service programs, they will act on behalf of a Defense agency, much the same as they do now for the Defense Logistics Agency (DLA), Defense Intelligence Agency (DIA), or the Department of Defense Dependent School System (DODDS).

Third, DMFO will take an active role in assessing facility condition and determining solutions to correct problems. Those of you assigned to hospitals, clinics, or NAVMEDCOM Geographic Commands have already seen this in the submission of the DoD Medical/Dental Facilities Condition Assessment Document (FCAD).

Hopefully, the importance of this document was not overlooked. It resembles an FPD, in that it asks for a local assessment of various functional components or systems (e.g., emergency services, laboratories, radiology, or plumbing) in percents adequate, substandard, or inadequate with deficiency codes.

It also includes, importantly, a "weight factor" column for the use of the DMFO with a roll-up of the weight factor and a final block — entitled "priority number." Clearly, this will play an important part in prioritizing future construction.

Fourth, the Services will continue to have the opportunity to provide to ASD(HA) their recommendations for programming across the FYDP. And, in fact, the Navy Surgeon General has provided to ASD(HA) a prioritized recommendation for projects across the current FYDP, FY 1988 to 1992. But the development and submission of a final medical construction Program Objectives Memorandum (POM) is the responsibility of ASD(HA).

The POM defines which projects will be programmed in each of the FYDP years. For FY 1988, these will be the projects ASD(HA) will include in the President's Budget submission to Congress. And for FY 1989, the specific projects identified in the POM will be those authorized for design start.

ECONOMIC ANALYSES

Another new facet in the medical military construction program will be the requirement to perform an economic analysis for certain medical facilities. The economic analysis is not quite a present value analysis of construction alternatives. In fact, the analysis might better be termed a health care planning study.

This analysis examines the population to be cared for, the types of services they require, the availability of other federal and civilian health care facilities, and the costs of providing care. It also looks at the condition of the existing military medical facility in terms of its ability to provide quality care and the costs of either repair, modification, or replacement.

Then, using an iterative approach, it seeks a ranked set of solutions by trading off alternative (i.e., private sector or other federal) health care services with the costs of replacement construction, alteration, or repair. This

is obviously a more comprehensive approach to economic analysis than the usual comparison of either building new or keeping the status quo.

This new approach in the medical world has been tested on three candidate facilities — one each from Army, Air Force, and the Navy's hospital in Newport, R.I. Additionally, the Navy has a study using this methodology underway for the Naval Hospital, Philadelphia, using the contract authority of NORTHDIV.

Studies are planned in FY 1987 for four additional Navy medical facilities: 29 Palms, Calif., Portsmouth, N.H., and Quantico, Va., all under CHESDIV authority; and the Naval Hospital, Portsmouth, Va. These four locations represent those locations requiring a formal economic analysis and proposed for potential construction start in FY 1989. Not all proposed medical construction projects will require this rigorous approach.

At a minimum, only those facilities programming space for retirees/dependents of retirees/survivors will absolutely require this methodology. But, in addition, those facilities lying in overlapping military medical facility catchment areas and/or having readily available civilian health care facilities can expect this approach. Isolated overseas facilities for which no alternative exists or facilities programmed for only active duty personnel, i.e., "troop clinics," will probably not require an economic analysis.

STANDARDIZATION

Another parallel change coming about which will dovetail with the creation of the DMFO is an initiative of NAVMEDCOM and NAVFAC to create functional standardization of medical facility design. This approach is *not* design standardization with site adaptation. Instead, it 's somewhat like a building block approach to preliminary (up to 35 percent) design.

For relatively simple facilities, clinics, the building can be viewed as multiples of a few basic functions — waiting room, exam rooms, offices, pharmacy, radiology, etc. The size of each of these functions, their inherent relationship to each other, and the footprint of the structure containing them is related to the workload and the site.

Balancing these factors within a functionally repetitive class of facilities lends itself to current CAD/CAM techniques. To take advantage of these opportunities, NAVMEDCOM and NAVFAC will begin a functional standardization design program for three to five clinics slated for the FY 1989 program. Northern Division is the lead EFD for this program which will include clinics at Camp Lejeune, N.C., Portsmouth, N.H., Quantico, Va., and 29 Palms, Calif.

This move to some type of standardization can be expected to continue in the future under DMFO. The advantage to them, as well as to the Navy, is to reduce the cost of design work and to save process time from project conception to completion.

IMPACT

A number of impacts will be felt as a result of the transfer of resources to ASD(HA). First, "fencing" medical MILCON monies will probably mean that relatively more money will be available since these projects will no longer compete with other Service programs.

On the other hand, the individual Services will no longer directly control the what, where, or when of construction. Service proposals will be carefully examined by the DMFO staff for consistency across Service lines. That will mean a more careful examination of preliminary scope documents, construction costs, and supporting facilities proposed.

Similarly, for selected projects which require an economic analysis, the scope shown on the DD 1391 will be the result of an independent, and outside, study. This study may well conclude that something other than new construction is warranted.

On the local scale, where the paper mill starts, it will be increasingly important to objectively report facilities' deficiencies. DD 1391Ps will continue to be sent to NAVMEDCOM through the GEOCOMs. However, the basis of the 1391, the Format B, and Space Plan, will be prepared in the near future by DMFO.

It is also likely that representatives of the DMFO will visit the facilities proposing construction. Specific rules for programming and construction project documentation will be issued by DMFO.

PROGNOSIS

Solutions developed by local activities or their supporting EFDs to facilities problems in medical facilities will, by necessity, change. The change will be brought on by the involvement of the DMFO in the planning, establishment of criteria, sizing, and design of medical facilities.

For facilities planners at the activity and EFD level, it would be good to understand and accept this fact of life to avoid creating expectations which cannot be fulfilled through our historical Navy channels. But, this should not be construed negatively.

Within that subset of construction programs devoted to medical projects, the resources available will be "fenced," and therefore be singularly available for the correction of demonstrable problems. How those resources are prioritized and allocated, however, will not be within the control of the activity, the EFD planning/design team, or even the Navy.

To be successful in this new environment, some preliminary rules of thumb might be borne in mind:

- Be objective in stating facilities problems and be prepared to back up/prove a relationship between the problem and health care delivery.
- If civilian or Veterans' Administration health care facilities are nearby (roughly a 40-mile radius), expect a health care planning study. Do not promise your chain of command a solution based upon past experience or the NAVFAC P-80. The health care planning study will serve as the basis of solution.
- Expect a visit from the DMFO staff if you have a project in the Defense Medical MILCON FYDP.
- And, as with any new organization, there are likely to be a few bugs in the system. It is in the best interest of our Service to work with DMFO and be professionals. □

Lab research supports 'Bees

By JERRY THOMAS
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Port Hueneme, Calif.

Since its establishment in 1948, the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, Calif., has served the Seabees with research that has resulted in the newest technology, latest hardware, and modern systems of operations.

The Laboratory was initially established to test commercial equipment for the Naval Mobile Construction Battalions organized during World War II. Since its relocation to Port Hueneme in 1950, NCEL has expanded its emphasis on the research and development of equipment and techniques to enhance Seabee performance. During the 1970s, the Laboratory incorporated programs on environmental protection and energy conservation.

Today, as a full spectrum RDT&E center, NCEL fulfills the responsibilities mandated in its mission statement: "to be the principal Navy RDT&E center for the shore facilities . . . and the Navy Construction Forces."

But what has NCEL done lately for the Seabees? Civil Engineer Corps? Shore facilities community?

Although listing and commenting on all recent NCEL contributions would be impractical, a survey of the five technical departments provides the following examples of technological advances, products and services that are having, or soon will have, positive impact on Seabees and their work environment:

• Supported by NCEL's development of new technology, the Navy has started cleaning up former hazardous waste disposal sites. The Laboratory developed a bioreclamation method that relies on natural organisms to decompose wastes into nontoxic components. Another clean-up process concentrates on dechlorination to remove toxic chlorine molecules from the chemicals in the soil. All told, 104 naval activities will be involved in this Department of Defense effort.

• The Laboratory has prepared and published a "Users' Guide on Lighting Management." Information in the Guide will permit facility managers to provide adequate visibility while reducing energy consumption and operating costs. The 30-page booklet features a checklist of four general energy conservation measures: reducing light levels, improving lighting efficiency, turning off lights in unoccupied spaces, and turning off lights where the available daylight is sufficient. When followed, these measures will reduce lighting power requirements and decrease lighting operating time.

• For almost 30 years, NCEL has been providing Navy divers with new tools, techniques, and power systems to improve their capabilities. Last fall, its Seawater Hydraulic Multi-Function Tool System was approved for Navy use. Acceptance marked the culmination of a major 10-year research effort to provide practical, custom-designed tools to meet divers' specific needs.

Seawater hydraulics offer many advantages over oil as a working fluid, such as: no environmental pollution, dramatic reduction of tool maintenance requirements, and elimination of fire hazards and slippery oil on decks. Three systems are to be delivered to Navy Underwater Construction Teams this year.

• An innovative hard-chrome plating process, developed by NCEL, applies a customized finish to vital parts for ships, weapons, aircraft, and

A marine draws a cup of drinkable water from the new Reverse Osmosis Water Purification Unit. The redesigned unit produces 1,200 gallons of water per hour from a seawater source.

The Navy must have new and improved piers

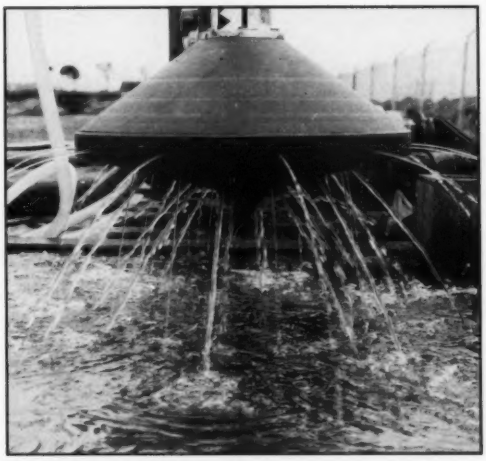
communications systems. Improved quality reduces the rejection rate by as much as 40 percent. Contaminated rinse waters are returned to the plating tank, resulting in "zero discharge" of waste waters. When all 50 Navy chrome-plating plants have been retrofitted with the new process, savings of $250 million will be realized during the 10-year life of the system.

• The military services needed an acceptable method to determine the quality of paints before starting major, expensive painting jobs. Lacking were simple field tests to determine if coatings were of suitable quality. The Laboratory has developed a portable field kit for testing commercial paints. The size of a briefcase and weighing less than 14 pounds, the kit can be used by field personnel with no technical training.

Painters now can conduct 14 tests on oil-based and latex paints, the two coatings most widely applied to military structures. Coatings that fail field inspection can be subjected to more sophisticated laboratory testing.

• Procurement of functional shelters in a timely manner has been a constant and costly problem. If a battalion of Seabees constructed an advanced bare-based camp, it would need at least 40 shelters, each with unique, built-in requirements. To remedy the problem, the Laboratory has designed the Advanced Base Shelter Evaluation Program (ABSEP).

The Computerized Adaptive Control System "remembers" programmed movements by which the articulated arm lifts containers from the truck and places them on the ground.



The Universal Pile Footing is shown during testing. The water is jetted from 20 nozzles in the spud can and center spike.

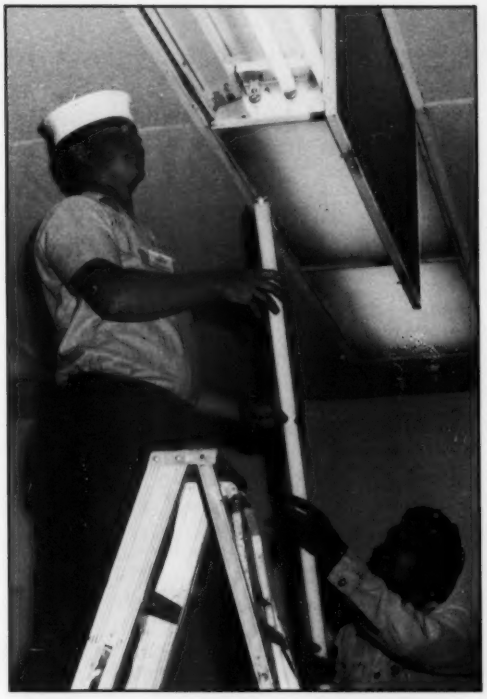
Now, procurement officers with specific shelter requirements can use ABSEP to determine and prepare pre-designed units best suited for their needs. More than 100 different types of shelters (all available Navy, DOD, and commercial structures) already have been included in the program.

• The Powered Causeway Section (PCS) was developed to transfer equipment, cargo, and personnel from ships at sea to shore. Consisting of a series of pontoons, the PCS is powered by two water-jet propulsion thrusters. It can make a complete circle within its 90-foot length in 40 seconds. A single PCS can push a ferry of non-powered, cargo-carrying causeway sections.

• The Navy must have new and improved piers to support the fleet. NCEL has developed designs for a concrete, double-deck, floating pier. The top deck (20 feet above the water line) coincides with the quarterdeck of a berthed ship.

The pier, 1,200 feet long and 75 feet wide, rises with the tide, maintaining constant elevations with the ship. Consequently, mooring and utilities lines don't require tending. The pier also can be constructed offsite and floated into place, reducing on-site construction time.

• More efficient systems are needed to transfer cargo from ships to troops ashore. To meet this need, NCEL is developing an improved Computerized Adaptive Controls (CAC) system for rapid movement of specialized equipment to



Seabees relamp a fixture at the Construction Battalion Center, Port Hueneme, Calif. Replacing all tubes at the same time — results in economies of labor time.

forward transfer areas. Incorporating advanced automation and computer technology, the innovative concept gives operators more responsive control over their machines, significantly enhancing their capabilities to handle materials under adverse conditions.

An automatic option and remote control enables the operator to move hazardous materials from a safe distance. Also, exposure to bad weather and combat conditions is reduced substantially.

• NCEL is developing a unique universal footing that uses a novel internal water jetting system to install steel foundation pilings in all types of sea floors. The concept was designed primarily for the Navy's Advanced Cargo Transfer Facility (ACTF), under construction at the Laboratory. Supported by a series of pilings placed into the sea floor, ACTF will extend more than 2,500 feet out from the shore to container ships berthed in water depths of 50 to 60 feet.

The new universal footing system provides a one-foundation capability for all sea floors — clay, silt, rock, sand, gravel, and coral. Although developed for a specific Navy project, the water-jetting concept could be applied to the offshore oil and gas industries.

New unit doubles potable water

• A lightweight, portable water well-drilling system is being developed specifically for advanced base operations. NCEL considers this rig to be the answer to a Navy need for a mobile, rapid-drilling operation capable of reaching water depths of 1,500 feet within five days. The rig will prove invaluable where surface water supplies are inadequate or contaminated. The design incorporates a mast/hoist assembly with telescopic steel cylinders. The design limits overall rig size to 20 feet in length, less than eight feet in height, and less than 24,000 pounds in weight.

• A reverse osmosis water purification unit developed by NCEL is capable of producing 2,000 gallons of drinkable water an hour from brackish water. The newly redesigned system also can produce 1,200 gallons of drinkable water an hour from seawater. The unit produces twice as much potable water as an earlier 600 gallon-per-hour purification system, while retaining the same size of the earlier model.

• NCEL has combined two alternative power sources—wind and solar—into the Navy's first hybrid energy system. The installation of two 20kw wind generators and a photovoltaic array of about 1,400 panels will provide at least 75 percent of the energy required for a 45,000 square-foot structure at Tudor Hill, Bermuda. The Navy envisions installing hybrid systems at remote facilities which rely upon diesel generators for electrical power. □

The Navy's first hybrid energy system is completing long-term evaluation at Tudor Hill, Bermuda. Two 20-kW wind generators and a small section of the photovoltaic panels are shown.

The current increase in NAVFAC litigation docket mandates re-emphasizing that our performance during contract disputes dictates whether we win or lose at trial. Inadequate or untimely factual documentation usually means that our position is not supported and thus will be ruled invalid by the court or the board.

The number of NAVFAC contract cases involving disputes of $250,000 or less filed at the U.S. Claims Court or the Armed Services Board of Contract Appeals increased almost threefold from 1983 to 1986. In 1983, 115 new cases were filed; 158 were filed in 1984; 233 were filed in 1985; and 340 new cases were filed in 1986. So far, the number of new cases filed in 1987 reflects that the trend is continuing to increase rather than leveling out or declining.

In view of the substantial increase in litigation disputes, it is essential that NAVFAC identify and preserve the relevant facts during contract performance.

Timely and appropriate documentation of relevant facts during contract performance is absolutely essential. All successful defenses to contractor claims depend upon the contemporaneous factual record. The factual records in all successful NAVFAC cases are characterized by contemporaneous documents that establish the who, what, where, when, why, and how of matters pertinent to the particular dispute.

After-the-fact records do not influence the board or the court as they may be too easily tainted by the adversarial positions of the parties. On the other hand, accurate and contemporaneous daily records (reports, correspondence, photographs, videotapes of construction performance) are the most persuasive facts that control the disposition of the case by the decision makers. Fancy lawyering and after-the-fact rationalizations are not effective substitutes for a contemporaneous, accurate, and factual record.

Substantial Navy savings in time, effort, and dollars always result if accurate, contemporaneous documentation of events incident to contract administration are kept.

Contact your attorneys as soon as you perceive a potential dispute during contract performance.

CBU-416 to install new Child Day Care Center at NSC Oakland

Did I hear someone say "new outdoor play area"?

NEW CHILD DEVELOPMENT CENTER IN THE WORKS

In an effort to improve the quality of life at the Naval Supply Center, Oakland, and make optimal use of available resources, the West Coast's largest supply base is installing a new Child Care Center. The Center will be installed in the soon-to-be vacated administrative building of the Navy Biosciences Laboratory which has been disestablished. This building, which was to have been demolished, will be renovated to provide a center suitable for 100 children in three separate wings of the building.

Each wing will contain several classrooms for toddlers and preschool age children, and an infant wing with cribs, as well as a centralized administration/reception area, multi-purpose room, and kitchen. A large outdoor play area with equipment will also be included in the project.

The Seabees from local Construction Battalion Unit 416 will accomplish the required interior demolition and complete the necessary architectural, mechanical, and electrical modifications to complete the new Child Care Center. To facilitate early start-up, the center will be accomplished one wing at a time. The design and technical requirements for the facility have been accomplished by LCdr. P. Migliore with the initial concept and assistance provided by NSC Oakland's Federal Women's Program Manager, Ms. Cheryl Thompson.

The project, scheduled for completion in early 1988, demonstrates innovative use of a building slated for demolition. It will provide a much needed service at a significant savings to the government by using military labor.

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Dual role as engineer/manager takes a lot of adjustment for most

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